REMARKS

Claims 1-14, 19 and 20 are pending. Claims 1, 2, 10, 14 and 19 have been amended. Claims 15-18 are withdrawn. Reconsideration and further examination is respectfully requested.

Claims 1-14 and 19-20 have been rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. This rejection is respectfully traversed with respect to these claims as amended herein. In response, claims 1, 2, 10 and 19 have been amended to recite outputting data, as recommended by the Examiner in paragraph 11 of the Official Action. As claims 3-9 are dependent from claim 2, claims 11-14 are dependent from claim 10, and claim 20 depends from claim 19, each claim now recites outputting data. As a result, the rejections under 35 U.S.C. §101 are now obviated.

Claims 1-14 and 19-20 have been rejected under 35 U.S.C. §102(a) as being anticipated by Optimal Technologies ("Operations Review of June 14, 2000 PG&E Bay Area System Events Using Aempfast Software"). This rejection is respectfully traversed with respect to these claims as amended herein.

As amended, claims 1, 2, 10 and 19 now variously recite "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the

transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses."

These aspects of the claimed invention promote comprehensive assessment of the effects of an electric power network by analyzing both transmission system and distribution system effects using a single mathematical model including effects caused by the interdependency of a plurality of transmission lines and a plurality of transmission electrical elements with a plurality of distribution lines and a plurality of distribution electrical elements. These aspects of the claimed invention permit interdependencies between transmission-level effects from transmission lines and transmission electrical elements and distribution-level effects from distribution lines and distribution electrical elements to be included in energy network analysis, improving the accuracy of the evaluation. Further, these aspects of the claimed invention enable assessment of the behavior of the entire electric power network at multiple distribution-level buses. These aspects are submitted not to be disclosed or suggested by the cited reference.

Specifically, Optimal Technologies is understood to disclose analyzing a power network. (col. 1, lines 6-10) Optimal Technologies discloses identifying loads that contribute to voltage collapse and ranking generators according to their output ability. (page 13, section 3, paragraph 1) However, there is no disclosure of the type of modeling used to perform this ranking. Merely ranking devices does

not disclose a "single mathematical model" that "models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as use of separate models for transmission and distribution networks allows the same ranking. Hence, the analysis disclosed in Optimal Technologies does not specify whether a distribution-level model, transmission-level model or other type of model is used to identify loads or rank generators. As Optimal Technologies does not disclose the type of modeling used, there is no indication in Optimal Technologies that the "ranking of possible additions to system resources" based on "contribution to system stability and power flow" cited by the Examiner uses a modeling technique other than conventional techniques that separately model transmission and distribution systems. Thus, Optimal Technologies fails to disclose the claimed element of "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses." (emphasis added)

Thus, there is no disclosure or suggestion of "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses" as variously recited in amended claims 1, 2, 10 and 19.

As amended, dependent claims 3-9, 11-14 and 20 variously recite additional patentable features such as: "integrating models of theoretical transmission-level real and reactive energy sources connected to one or more of the plurality of transmission level buses into the single mathematical model," or "integrating additional models of theoretical transmission-level loads into the single mathematical model," or "adding to the single mathematical model the models of the energy sources at one of the distribution-level buses and transmission-level buses, wherein the models of real energy sources are added subject to actual limits appropriate for dispatchable demand reductions available on the electric power network, and the real energy sources with reactive energy sources are added subject to actual limits appropriate for generation at load sites within the electric power network," or "calculating impacts and effects across the simulated electric

power network of the theoretical distribution-level real and reactive energy sources connected on one or more of the plurality of distribution level buses."

These aspects of the claimed invention are not disclosed in Optimal Technologies, which is understood to disclose identifying loads that contribute to voltage collapse and ranking generators according to their output ability. (page 13, section 3, paragraph 1). Therefore, Optimal Technologies does not anticipate these claims that are, accordingly, submitted to be patentably distinguishable over the cited art.

Claims 1, 2, 6 and 19 have been rejected under 35 USC §102(e) as being anticipated by Rehtanz et al. '175 (U.S. Patent No. 7,096,175 B2). This rejection is respectfully traversed with respect to these claims as amended herein.

As amended, these claims now variously recite "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses." (emphasis added) This modeling of the inderdependency between a plurality of transmission elements, such as wires and electrical elements, and a plurality of distribution elements, including wires and electrical elements,

improves the accuracy of energy network simulation and are submitted not to be disclosed or suggested by the cited reference. By modeling the interdependency between a plurality of transmission elements and a plurality of distribution elements, the effects of problems in the distribution network on the transmission network are directly evaluated and the interaction of all elements in the transmission network and the distribution network are efficiently evaluated using a single mathematical model.

Specifically, Rehtanz et al. '175 is understood to model the stability of an electric power transmission network. (col. 1, lines 6-10) The modeling disclosed in Rehtanz et al. '175 approximates the effects of network distribution by including only load parameters indicating the static or stationary behavior of loads such as distribution networks by representing the distribution network as a single element. (col. 5, lines 32-34; col. 3, lines 11-27) This does not model "interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses" as recited in amended claim 1. Rather, Rehtanz et al. '175 discloses, at most, modeling a relationship between electrical elements in the transmission model with a single element which represents the entire distribution network rather than the interaction between a plurality of electrical elements in the model of the distribution level buses and a plurality of

electrical elements in the model of the transmission level buses. Hence, the modeling in Rehtanz et al. '175 is only capable of modeling interactions between the entire disbribution network and the transmission level electrical elements, and cannot simulate "interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses" as claimed.

Thus, there is thus no disclosure or suggestion of such aspects of the claimed invention found in Rehtanz et al. '175 which, therefore, does not anticipate these claims that are, accordingly, submitted to be patentably distinguishable over the cited art.

Claims 3-5, 7-14 and 20 have been rejected under 35 USC §103(a) as being unpatentable over Rehtanz et al. '175 in view of Rehtanz et al. '915 (U.S. Patent No. 6,885,915 B2). This rejection is respectfully traversed with respect to these claims as amended herein.

As amended, independent claim 10 recites "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level

buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses."

These aspects of the claimed invention are not disclosed or suggested by the cited references considered either alone or in the combination proposed by the Examiner. As stated above, Rehtanz et al. '175 fails to disclose modeling the interdependency of a plurality of transmission electrical elements, a plurality of transmission lines, a plurality of distribution electrical elements and a plurality of distribution lines to model a relationship between transmission-level effects and distribution-level effects. Rehtanz et al. '915 fails to cure this deficient disclosure. Specifically, Rehtanz et al. '915 is understood to model the effect of different device configurations on an electrical power distribution network. (col. 1, lines 6-7) This technique evaluates multiple device configurations to analyze different configurations of an electrical power distribution network. (col. 5, lines 39-65). However, this evaluation only models the distribution network and does not account for "interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as recited in amended claim 10. Hence, the model disclosed in Rehtanz et al. '915 does not use a single mathematical model accounting for "interdependency between the…plurality of transmission electrical elements included in the model of the

transmission level buses and…the plurality of distribution electrical elements included in the model of the distribution level buses," but only uses a dingle model to evaluate the distribution level network as a discrete entity. Therefore, Rehtanz et al. '915 fails to disclose a "single mathematical model" which models "interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as recited in amended claim 10.

As claims 3-5 and 7-9 depend from claim 2, claims 11-14 depend from claim 10 and claim 20 depends from claim 19, the arguments advanced above are also applicable to these claims. Dependent claims 3-5, 7-9, 11-14 and 20 also variously recite additional aspects such as: "integrating models of theoretical transmission-level real and reactive energy sources connected to one or more of the plurality of transmission level buses into the single mathematical model," or "integrating additional models of theoretical transmission-level loads into the single mathematical model," or "adding to the single mathematical model the models of the energy sources at one of the distribution-level buses and transmission-level buses, wherein the models of real energy sources are added subject to actual limits appropriate for dispatchable demand reductions available on the electric power network, and the real energy sources with reactive energy sources are added

subject to actual limits appropriate for generation at load sites within the electric power network." These aspects of the claimed invention are not disclosed or even suggested by the cited references considered either alone or in the combination proposed by the Examiner.

Rehtanz et al. '915 discloses a model for automatically configuring an electrical power distribution network by evaluating various device configurations. (col. 5, lines 39-65). The evaluation disclosed in Rehtanz et al. '915 only models different configurations of the distribution network without accounting for effects from the transmission electrical elements and/or the transmission lines transmission network. Hence, the combination of Rehtanz et al. '915 and Rehatanz et al. '175 at most discloses a model where various configurations of the distribution network are modeled and used to generate a representation of the distribution network in its entirety. This model of the entire distribution network is then used to evaluate the effect of the entire distribution network on the transmission-level buses. Hence, this combination does not model "interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses,"

Therefore, merely combining these references fails to establish a *prima facie* basis including all of the claimed steps of claims 3-5, 7-9, 11-14 and 20 from

which a proper determination of obviousness can be formed. It is therefore respectfully submitted that claims 3-5, 7-9, 11-14 and 20 are now patentably distinguishable over the cited art, both alone and in combination.

Favorable consideration is solicited. Should the Examiner wish to discuss the above Remarks, or if the Examiner believes that for any reason direct contact with Applicants' representative would help to favorably dispose this case, the Examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,
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